

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
8 March 2001 (08.03.2001)

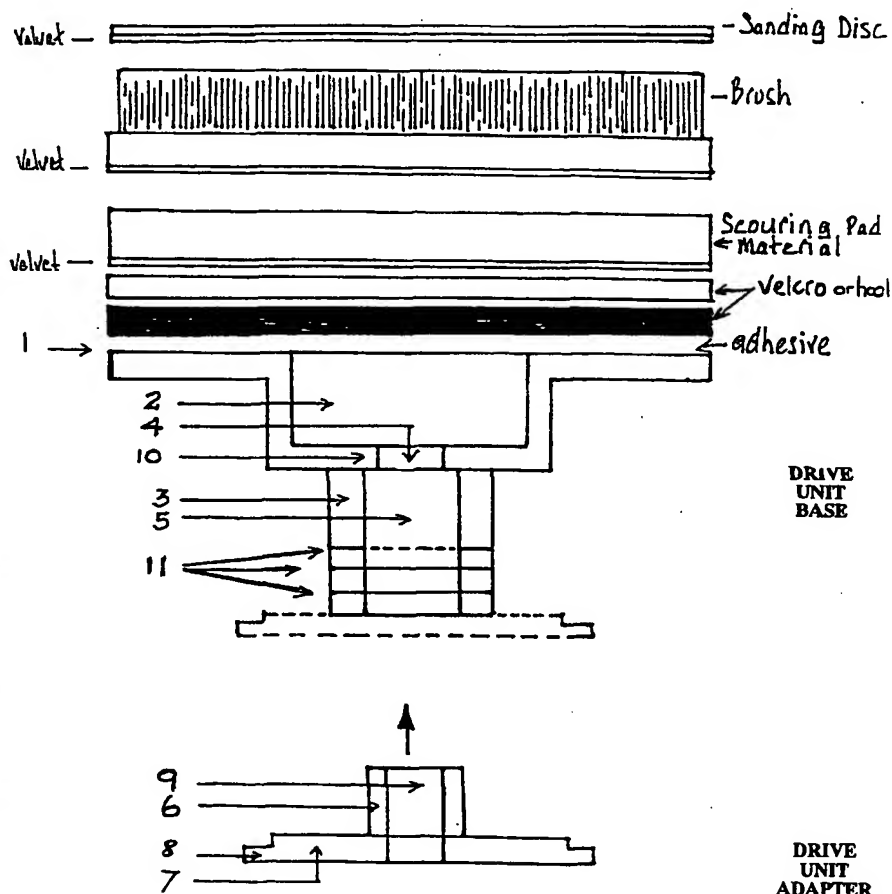
PCT

(10) International Publication Number  
**WO 01/15871 A1**

- (51) International Patent Classification<sup>7</sup>: B25F 3/00, 5/00, B08B 1/04, A01D 34/412, 34/416, 42/06, A47L 11/14, 11/28, 11/283, 11/40
- (21) International Application Number: PCT/AU00/01015
- (22) International Filing Date: 28 August 2000 (28.08.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
PQ 2473 27 August 1999 (27.08.1999) AU
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: CLEANING CONVERSION UNIT



(57) Abstract: A cleaning conversion unit made of a drive unit adaptor, a drive unit base, various attachments such as a brush, scourer, sander, mop, the drive unit adaptor comprising a circular plate with six castellated teeth, and a fixed central square fixed drive shaft with a centred locating hole, the drive unit base comprising a round head with a flat base to which hook and loop product is attached for fixing the various attachments.

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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *With international search report.*

## CLEANING CONVERSION UNIT

Many businesses and individuals have a need for a simple (yet powerful) rotating tool to clean dirty surfaces.

This new invention offers a powerful cleaning solution, which utilises the mobility of *common* small-business and domestic garden tools. It is designed to assist the cleaning of dirty surfaces, including but not limited to dust, moulds, stains, grease and oil, etc.

### PRIMARY COMPONENTS

It is made up of two main components, being a “*drive unit adaptor*” (hereinafter referred to as the “*Adaptor*”)(refer Annexures Fig 2) and a “*drive unit base*” (hereinafter referred to as the “*Base*”)(refer Annexures Fig 1), which enables a replacement fitting to most brushcutters (otherwise known as whipper snippers as the case may be) of different makes, for the purpose of attaching various forms of either a ‘BRUSH, SCOURER, SANDER or MOP’ .

### SIMPLE FITTING INSTRUCTIONS

The **Adaptor** and **Base** replaces the flexible nylon-string head, (or blade as the case may be), commonly used in most brushcutters. The **Adaptor** is designed with a square drive that fits straight onto any square-drive brushcutter. In addition the **Adaptor** is designed to convert hexagonal drive brushcutters to square drive to accept the adaptor **Base**. The adaptor utilises the original nut to secure the **Base**. Once attached, the **Base** accepts a variety of either a brush, scourer, sander or mop attachment by pressing firmly onto the newly attached base.

The first part of this simple conversion is achieved when the existing head is removed by unscrewing the central (outer spool) lock-nut. The **Adaptor** is then attached to the outer spool of the Brushcutter. The **Base** is then attached to the **Adaptor** and the lock-nut screwed back in place.

### MATERIALS

The **Adaptor** and the **Base** will be made of compressed or injected polypropylene or nylon to comply with ASA design standards and regulations.

DIAGRAMS

To assist with understanding this invention, diagrammatic reference will be made as follows:-

- Annexure 1:** Shows the the side elevation of the two (2) components of the invention, being the **Adaptor** (refer fig 2: drive unit adaptor) and the **Base** (refer fig 1: drive unit base).
- Annexure 2:** Shows the side elevation and measurements.
- Annexure 3:** Shows the top elevation of the **Base** fig. 1(a) and the **Adaptor** fig. 2(a).
- Annexure 4:** Shows the bottom elevation of the **Base** fig. 1(a) and the **Adaptor** fig. 2(a).
- Annexure 5:** Shows all the components and accessories that will attach to the head of the **base**.

Numbered references to the description as follows:

DRIVE UNIT BASE

**1 Base head surface for attachment of cleaning accessories.**

The cleaning accessories are attached using a unique industrial strength velcro-style product, that enables a firm and secure fix in accord with Australian safety standard requirements.

**2 Void internal area for fixing nuts.**

The internal surface is recessed 20mm (depth) and 50mm (wide) to accommodate different size screws and lock-nuts of differing models of brushcutters.

**3 Outer drive shaft unit.**

The drive shaft consists of a 34mm circular body (width) by 33mm (length).

**4 14mm locating hole.**

The drive shaft incorporates a 14mm centred hole for easy assembling.

**5 19mm square female internal drive.**

This square female internal drive is compatible to many square drive arbors fitted to straight drive brushcutters.

**6 19mm square male drive.**

This square female internal drive will accept the square male drive of the adapter unit (refer fig.2).

DRIVE UNIT ADAPTER**7            6 lug Drive Unit Adaptor.**

The 6 lug Drive Unit Adapter (fig. 2) will fit into the body of most bent shaft whipper snippers. Installation of this unit will enable conversion of hexagonal drives to square drives, and therein the attachment of the universal base (fig. 1), by sliding the female square internal drive (ie. Item 5) over the male square of the Adapter (ie. Item 6) as previously explained.

**8            Lugs**

The lugs clip into the brushcutter/whipper snipper unit as per the original head that is to be removed.

**9            11mm locating hole for the adaptor.**

The 11mm hole will centralise the adaptor on the shaft.

**10          Base of internal surface (locking nuts).**

Once fitted together, check that the threaded shafts are through far enough into the void cavity [ie. item 2] to be able to tighten the nuts and secure all the components tightly.

**11          Cut lines 5mm spacings to shorten drive units (if required).**

If the threaded shaft is below the lock-nut securing surface (ie. inside the void referred to at Item 2) there are three (3) cut lines marked at 5mm spacings. To enable utility of this product by most brushcutters, a total of 15mm can be removed to lower the components onto the shaft.

- (c) Circular brush head having a diameter of approximately 125 millimetres and a thickness up to 50 millimetres, said brush head which is pre-manufactured and which may be provided in a range of grades of bristles. To enable the proper attachment of the brush head to the hook surface of the drive unit base, the *brush head* provides on one spherical surface, a compatible material which enables fixation to the hooking mechanism.
- (d) Circular mop head having a diameter of approximately 125 millimetres and a thickness up to 50 millimetres, said mop head which is pre-manufactured, may be provided in a range of grades. To enable the proper attachment of the *mop head* to the hook surface of the drive unit base, the head provides on one spherical surface of the *mop head* a compatible material which enables fixation to the hooking mechanism.
- (e) Any other attachment not referred to herein which may by effect utilise the rotary nature of the invention together with the utility and power of the brush cutter.

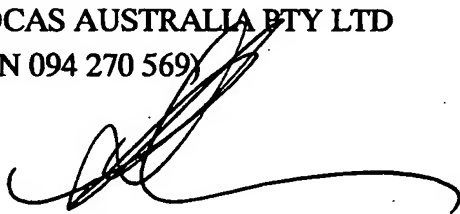
**CLAIM 5.** The drive unit adaptor referred at CLAIM 1 attaches directly to the driving spindle of the brush cutter (or whipper snipper as the case may be) by turning and locking the castellated teeth into the notches of the brushcutter spool.

**CLAIM 6.** The drive unit base referred to at CLAIM 2 is then attached to the drive unit adaptor by inserting the male "driven" shaft of the drive unit adaptor into the female "driving" socket of the drive unit base. The multi-purpose cleaning attachments referred to at CLAIM 4 herein, are attached to the drive unit base by pressing the attachment onto the hook and loop surface of the drive unit base.

**CLAIM 7.** The parts of the invention described herein in CLAIMS 1 through 6 as herein described with reference to the accompanying drawings.

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(ACN 094 270 569)

11 September 2000



This invention provides for an extension of the use of brushcutters(also known as whipper snippers) by the attachment and use of specifically designed Adaptors for the fitting of a multi-purpose base for the utility of various orbital scrubbing, cleaning and sanding devices.

The claims defining the invention are as follows:

- CLAIM 1.** A cleaning conversion unit which is made of a drive unit adaptor (hereinafter referred to as the "adaptor"), a drive unit base (hereinafter referred to as the "base") and various rotary attachments such as, a brush, scourer, sander or mop.
- CLAIM 2.** The drive unit adaptor comprises a circular plate with six (6) castellated teeth. In addition the drive unit adaptor has a fixed central square fixed drive shaft with a centred locating hole.
- CLAIM 3.** The drive unit base referred to in CLAIM 1 herein is comprised of an enlarged round head with a flat base to which a hook and loop product (similar to velcro) is attached for the purpose of fixing the various cleaning attachments. The base is approximately 58 millimetres tall and comprises further a circular stepped driven shaft which has a square drive recess centrally located at the top of the base unit. On the attachment fixing surface, centrally located in circular form is a recessed (approximately 20 millimetres) fixing surface for the locating wing nut.
- CLAIM 4.** The attachments referred to in CLAIM 1 herein comprise:
- (a) Circular scourers [disks] having a diameter of approximately 125 millimetres and a thickness up to 50 millimetres, said standard plastic and/or nylon disk which is pre-manufactured by way of interlocking woven thread and which may be provided in a range of grades of coarseness (treated). To enable the proper attachment of the *disk* to the hook surface of the drive unit base, the *disk* provides on one spherical surface, a compatible material which enables fixation to the hooking mechanism.
  - (b) Circular sanding disk having a diameter of approximately 125 millimetres and a thickness up to 50 millimetres, said standard disk which is pre-manufactured by way of interlocking woven thread [or other treatment] and which may be provided in a range of grades of coarseness (treated). To enable the proper attachment of the *sanding disk* to the hook surface of the drive unit base, the sanding disk provides on one spherical surface of the sanding disk a compatible



ANNEXURE 1

SCALE 1:100

SIDE ELEVATION

FIGURE I AND II

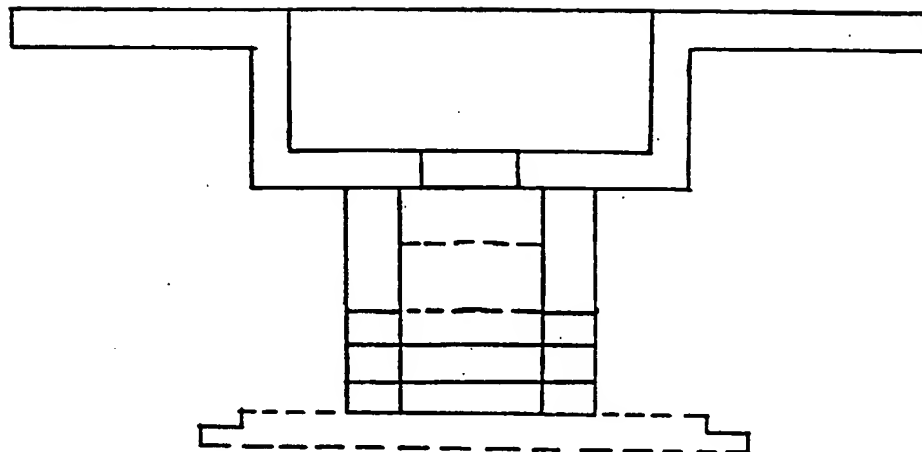


Figure 1

**DRIVE  
UNIT  
BASE**

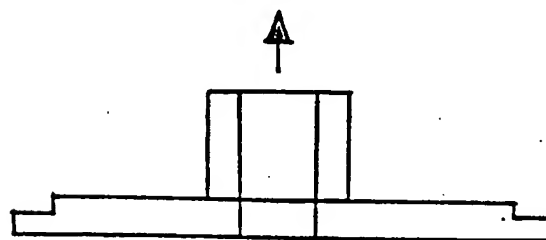
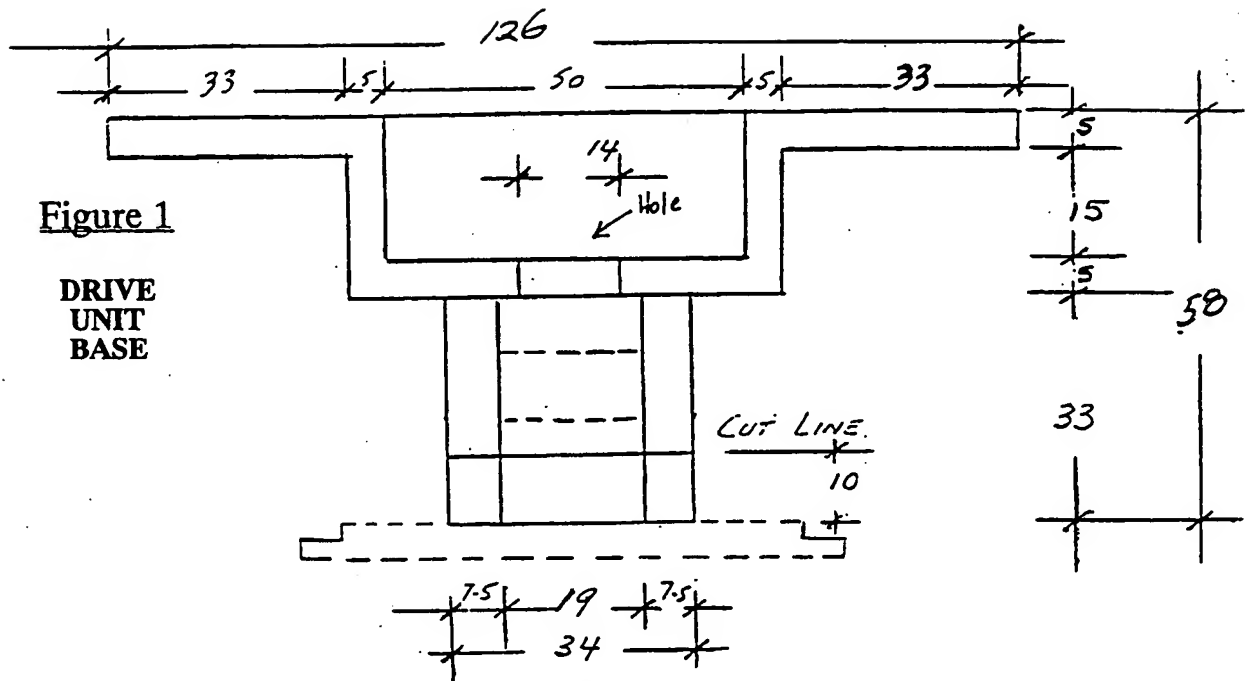
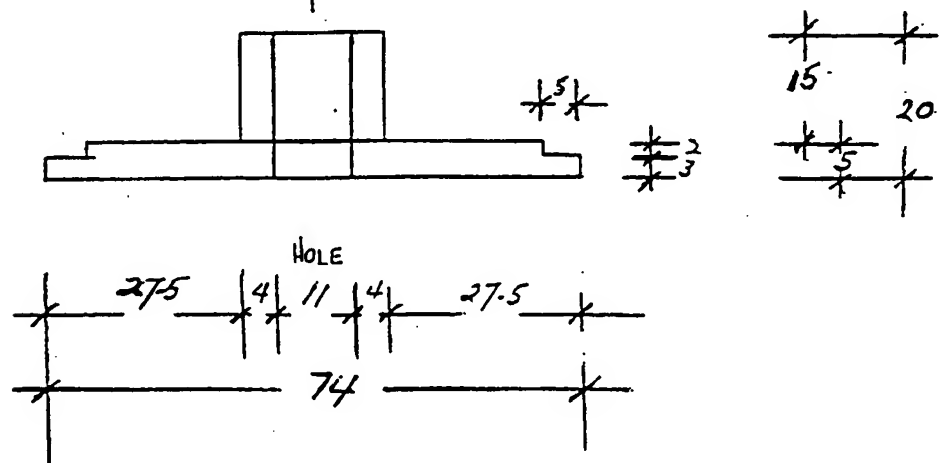


Figure 2

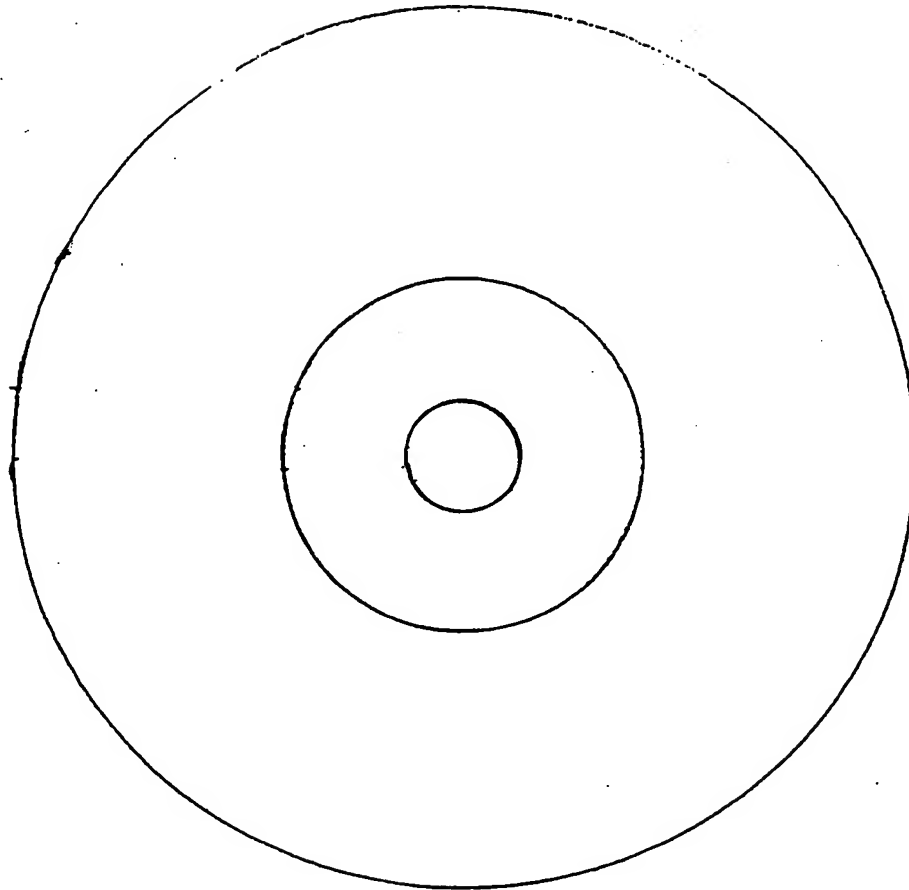
**DRIVE  
UNIT  
ADAPTER**

ANNEXURE 2SCALE 1:100SIDE ELEVATION  
MEASUREMENTSFigure 1DRIVE  
UNIT  
BASEFigure 2DRIVE  
UNIT  
ADAPTER

**ANNEXURE 3**

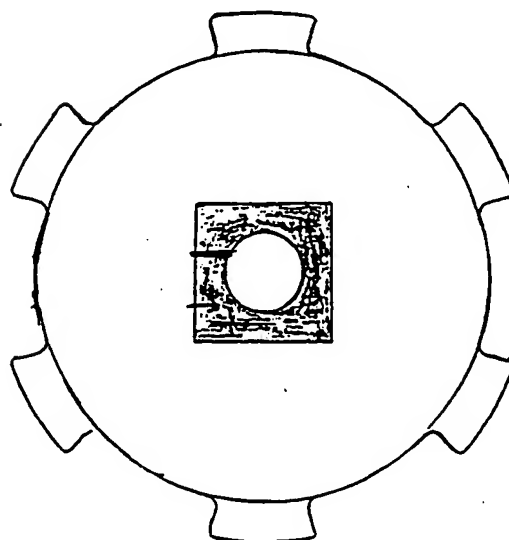
**SCALE     1:100**

**TOP ELEVATION**



**Figure 1**

**DRIVE  
UNIT  
BASE**

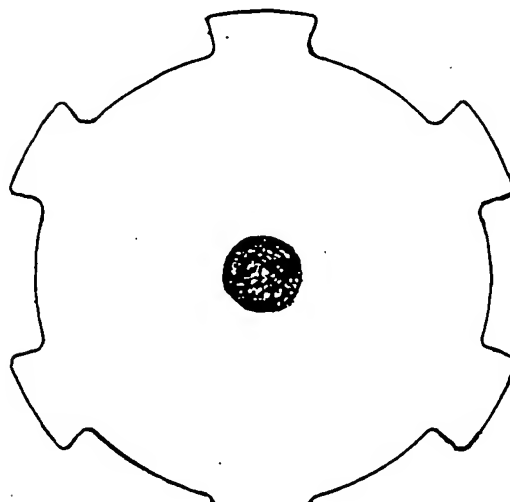


**Figure 2**

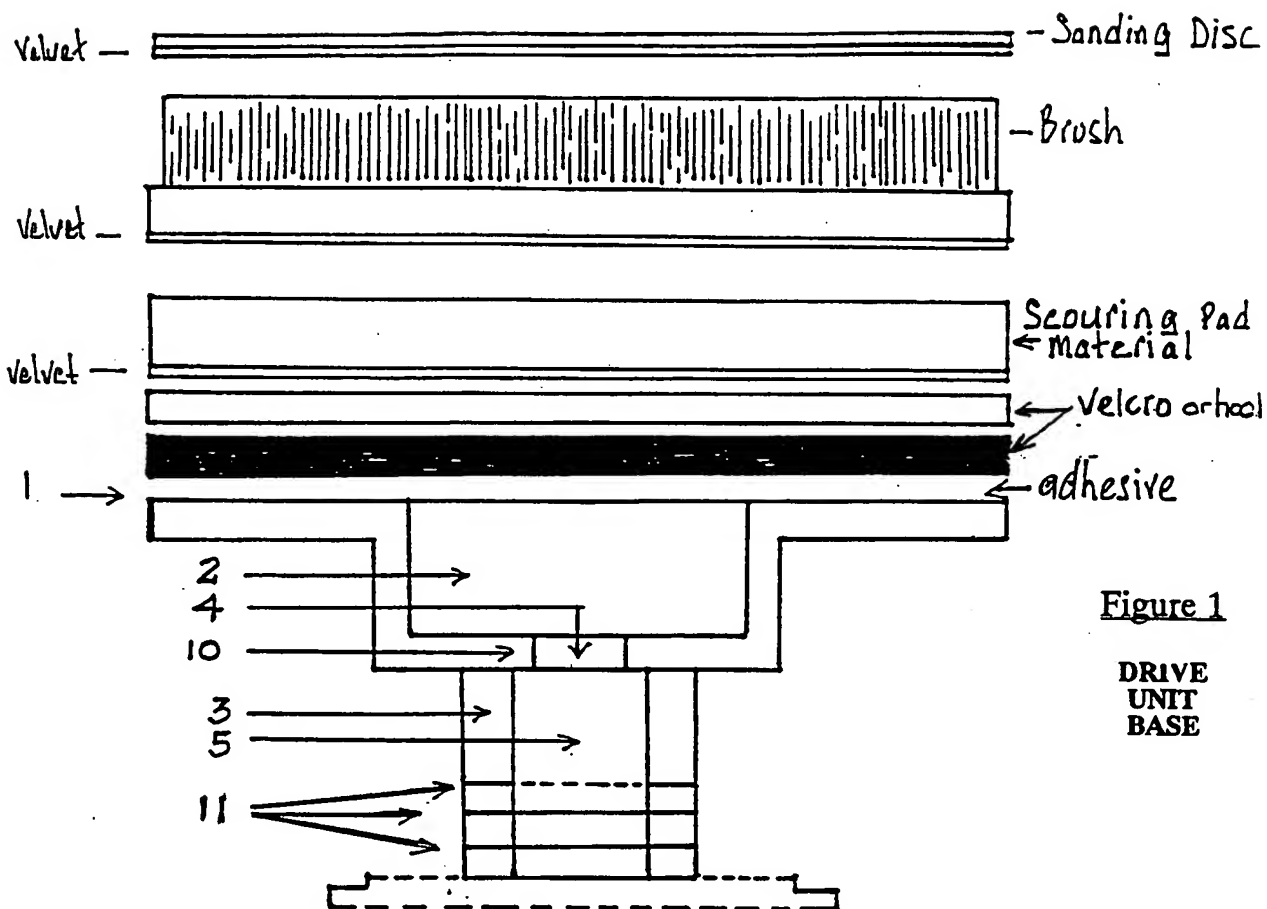
**DRIVE  
UNIT  
ADAPTER**

ANNEXURE 4SCALE 1:100

BOTTOM ELEVATION

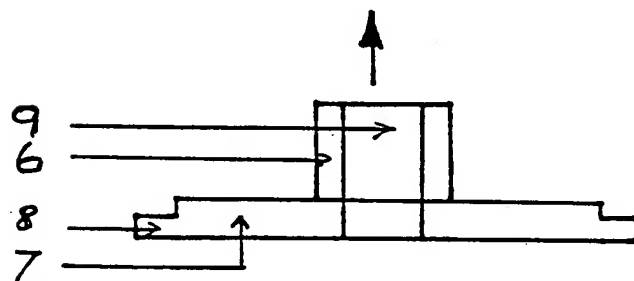
Figure 1DRIVE  
UNIT  
BASEFigure 2DRIVE  
UNIT  
ADAPTER

**ANNEXURE 5**



**Figure 1**

**DRIVE  
UNIT  
BASE**



**Figure 2**

**DRIVE  
UNIT  
ADAPTER**

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/01015

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
Int. Cl. <sup>7</sup> : B25F 3/00, 5/00; B08B 1/04; A01D 34/412, 34/416, 42/06; A47L 11/14, 11/28, 11/283, 11/40		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: B25F 3/00, 5/00; B08B 1/04, A01D 34/412, 34/416, 42/06; A47L 11/14, 11/28, 11/283, 11/40		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
AU: IPC AS ABOVE		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
DWPI and key words		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5201785 A (NAGANO) 13 April 1993 Whole document	1, 3-6
X	US 5579554 A (PLAZANET) 3 December 1996 Whole document	1, 3-6
X	US 4910826 A (RONES) 27 March 1990 Whole document	1, 3-6
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 13 November 2000		Date of mailing of the international search report 20 NOV 2000
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer  L. DESECAR Telephone No : (02) 6283 2381

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/01015

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4114225 A (MALISH et al.) 19 September 1978 Whole document	1, 3-6
X	US 4188719 A (HOFF) 19 February 1980 Whole document	1

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU00/01015**Box I** Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos :  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box II** Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental sheets I-II.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims, covered by claims Nos.: 1, 3-6.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/01015

**Supplemental Box I**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: II**

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are six inventions:

1. Claim 1 is directed to a cleaning conversion unit made of a drive unit adaptor, a drive unit base, and various rotary attachments such as a brush, scourer, sander or mop. It is considered that the drive unit adaptor, drive unit base, and various rotary attachments such as a brush, scourer, sander or mop comprises a first "special technical feature".
2. Claim 2 is directed to a drive unit adaptor comprising a circular plate with six castellated teeth, a fixed central square drive shaft with a centred locating hole. It is considered that the circular plate with six castellated teeth, fixed central square drive shaft with a centred locating hole comprises a second "special technical feature".
3. Claim 3 is directed to a drive unit base approximately 58 millimetres tall comprising an enlarged round head with a flat base to which a hook and loop product is attached for the purpose of fixing various cleaning attachments, the flat base having a centrally located recessed (approximately 20 millimetres) fixing surface for locating wing nut, a circular stepped driven shaft having a square drive recess centrally located at the top of the base unit. It is considered that the drive unit base approximately 58 millimetres tall comprising an enlarged round head with a flat base to which a hook and loop product is attached for fixing various cleaning attachments, the flat base having a centrally located recessed (approximately 20 millimetres) fixing surface for locating wing nut, a circular stepped driven shaft having a square drive shaft having a square drive recess centrally located at the top of the base unit comprises a third "special technical feature".
4. Claim 4 is directed to attachments comprising circular scourers (disks), circular sanding disk, circular brush head, circular mop head each having a compatible material enabling fixation to a hooking mechanism. It is considered that disks having a compatible material enabling fixation to a hooking mechanism comprises a fourth "special technical feature".
5. Claim 5 is directed to a drive unit adaptor attaching directly to a driving spindle of a brush cutter (or whipper snipper) by turning and locking castellated teeth into notches of a brush cutter spool. It is considered that a drive unit adaptor attaching directly to a driving spindle of a brush cutter (or a whipper snipper) by turning and locking castellated teeth into notches of a brush cutter spool comprises a fifth "special technical feature".
6. Claim 6 is directed to a drive unit base attached to a drive unit adaptor by inserting a male "driven" shaft of the drive unit adaptor into a female "driving" socket of the drive unit base. Multi-purpose cleaning attachments are attached to the drive unit base by pressing the attachment onto a hook and loop surface of the drive unit base. It is considered that a drive unit base attached to a drive unit adaptor by inserting a male "driven" shaft of the drive unit adaptor into a female "driving" socket of the drive unit base, multi-purpose cleaning attachments are attached to the drive unit base by pressing the attachment onto a hook and loop surface of the drive unit base comprises a sixth "special technical feature".

(continued see Supplemental Box II)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/01015

**Supplemental Box II**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: II**

Since the above mentioned groups of claims do not share any of the technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept.

International application No.  
**PCT/AU00/01015**

Patent Document Cited in Search Report				Patent Family Member			
US	5579554	EP	702925	FR	2723831		
US	4910826	EP	361505				
US	4188719	AU	35603/78	CA	1086086	DE	2816751
		FR	2388156	GB	1597434	JP	53134140
		US	4226021	US	4335585	IT	1094412
		US	4126928				
END OF ANNEX							